

Introduction

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The East Mojave National Scenic Area (EMNSA), designated on January 13, 1981 (46 Federal Register 3994) by the Secretary of Interior and modified on August 9, 1983 (48 Federal Register 36,210), encompasses approximately 1.5 million acres of federal, state, and private land in the Mojave Desert of southern California. The lands are in northeastern San Bernardino County, adjacent to the Nevada border about halfway between Barstow and Las Vegas (fig. 1).

Under the California Desert Protection Act, first introduced in 1986 and signed into law on October 31, 1994, most lands of the EMNSA were incorporated into the Mojave National Preserve under the administration of the National Park Service. General differences in areal extents of the EMNSA and the Mojave National Preserve (MNP) are shown at small scale on figure 2, and the borders of the two areas also are included at 1:125,000 scale on plates 1–6 for comparative purposes. The major difference between the two is the exclusion of (1) an approximately 3-km-wide corridor along Interstate 15 in the general area of the north boundary of the MNP, south of the Clark Mountain Range, (2) an irregularly shaped area of approximately 100 km² in the general area of Castle Mountains, and (3) a large number of small parcels of land in the Lanfair Valley area, in aggregate approximately 160 km² (not shown separately on the plates). The impending withdrawal of all these lands for protection in the late 1980s and early 1990s prompted a series of investigations by the U.S. Bureau of Mines and the U.S. Geological Survey to assess the nature and extent of mineral resources in the area under consideration. The present report is an updated version of previous studies by the U.S. Geological Survey (U.S. Geological Survey, 1991; Hodges and Ludington, 1991; Miller and others, 1991).

The legislative history that culminated in elevation of the EMNSA (the name is retained for the area studied in this report) to National Preserve status began in 1976 with creation of the California Desert Conservation Area (CDCA), which comprised about 25 million acres total in separate tracts in southern California. Established by Congress under Section 601 of the Federal Land Policy and Management Act, about half of the Conservation Area was public land administered by the Bureau of Land Management (BLM), which completed a comprehensive plan for multiple use of the entire area in 1980. Numerous sites considered by BLM to be Areas of Critical Environmental Concern are scattered throughout the conservation area, and several are within the EMNSA.

In 1986 the California Desert Protection Act was introduced in Congress by California Senator Alan Cranston and Representative Mel Levine. Under that proposed Act, which was reintroduced in 1991, approximately 4.5 million acres of the CDCA, including the EMNSA, were to be transferred to the National Park Service and granted National Park status. In January 1993 as the 103d Congress began, the California Desert Protection Act was again introduced, as Senate Bill 21, by Senator Diane Feinstein of California; this Bill was cosponsored by Senator Barbara Boxer, also of California, and 21 other Senators. The companion House Resolution H.R. 518 was also introduced in January 1993 by Congressmen Richard Lehman and George Miller of California and cosponsored by 15 other Representatives. In both of these bills, the EMNSA was to be abolished: Senate Bill 21 created Mojave National Park, whereas the House version created Mojave National Monument, in place of the EMNSA. In July 1991, President George H.W. Bush countered the above protection acts with a proposal that approximately 2.24 million acres in 62 individual units, most of them in the southern California desert, be added to the National Wilderness Protection System under the California Public Lands Wilderness Act; six of these units (CDCA–239, –250, –256, –262, –263, and –266) were in the EMNSA.

In order that the available mineral-resource data base be as complete as possible while these bills were before Congress, an evaluation of known and undiscovered, metallic mineral resources of the EMNSA was undertaken by the U.S. Geological Survey as a successor to investigations by the U.S. Bureau of Land Management (1980; 1982) and recently completed studies by the U.S. Bureau of Mines (1990a; Schantz and others, 1990; Wetzel and others, 1992). A few parts of the California Desert Conservation Area, generally outside the EMNSA, are among the most highly mineralized regions in the nation (Weldin, 1991).

The EMNSA includes the following units of the California Desert Conservation Area, all of which were initially designated BLM Wilderness Study Areas (WSA), but only eight of which were found suitable for wilderness designation by BLM:

CDCA-227	Clark Mountain
CDCA-235A	Shadow Valley
CDCA-237	Magee-Atkins
CDCA-237A	Deer Spring
CDCA-237B	Valley View
CDCA-238A	Teutonia Peak
CDCA-238B	Cima Dome
CDCA-239	Cinder Cones
CDCA-243	Old Dad Mountain
CDCA-244	Rainbow Wells
CDCA-245	Eight-Mile Tank
CDCA-249	Kelso Mountains
CDCA-250 (part)	Kelso Dunes
CDCA-256 (part)	Bristol-Granite Mountains
CDCA-262	South Providence Mountains
CDCA-263	Providence Mountains
CDCA-264	Mid Hills
CDCA-265	New York Mountains
CDCA-266	Castle Peaks
CDCA-267	Fort Piute
CDCA-270	Table Mountain
CDCA-271	Woods Mountains
CDCA-272	Signal Hill

After preliminary examination of these lands with respect to the extent of their existing use and state of degradation, BLM recommended the following eight units for wilderness designation: CDCA-237A, -239, -250 (part), -256 (part), -262, -263, -266, and -267. Of these, only the six listed earlier were included in the proposed Wilderness Act of July 1991. However, the Mojave National Preserve as finally enacted into law as part of the California Desert Protection Act includes 22 Wilderness Areas (Frank Bono, written commun., 1995), most of which were on the original list of WSAs proposed by BLM. Nonetheless, some substantive changes were made involving the following units:

Cima Dome (formerly the Deer Spring, Teutonia, and Cima Dome WSAs)

Shadow Valley (formerly the Shadow Valley and Valley View WSAs)

Joshua Forest (formerly the Magee-Atkins WSA)

Rainbow Wells North (part of the Rainbow Wells WSA north of Mojave Road)

Rainbow Wells South (part of the Rainbow Wells WSA south of Mojave Road)

Marl Mountains (not previously designated as a WSA by BLM)

Old Dad Mountain (previously designated as a single area, parts of which are now (1995) included in two areas under one name)

Devil's Playground (formerly part of the Old Dad Mountain WSA)

Soda Lake (not previously designated as a WSA by BLM)

Thus, the only two units that did not become Wilderness Areas when the Mojave National Preserve was created are Signal Hill and Eight Mile Tank, which BLM had originally designated as WSAs but did not recommend for wilderness status.

The known mineral resources of the eight units formerly recommended as WSAs by BLM, as well as of all others recommended for wilderness designation within the California Desert Conservation Area, were examined by the U.S. Geological Survey and the U.S. Bureau of Mines. A Mineral Summary was prepared as

Background Data for the California Desert Protection Act of 1987 (U.S. Department of Interior, 1988). These studies were, necessarily, cursory and recommended additional investigations before any land-use decisions were made, particularly where substantial mineral resources were identified.

The present report contains an assessment of the potential for discovery of new metallic mineral resources specifically within the EMNSA, that partly updates earlier studies (U.S. Geological Survey, 1991; Hodges and Ludington, 1991), and it includes data derived from limited field examinations specifically for this report by some of the authors of the various sections below. This report also includes syntheses from the ongoing detailed investigations of many geologists. These geologic investigations are aimed primarily toward assembling a modern geologic framework for the region but also include study of the mineral resources of many individual areas considered for wilderness designation within the EMNSA.

Known mineral occurrences are classified by deposit type insofar as possible, and tracts of ground that are permissive geologically for additional discoveries of such deposits are outlined, with discussion of deposit-type characteristics; degree of favorability for discovery is included where adequate information exists on which to base such evaluations. A previously published report presents estimates of the numbers of undiscovered deposits for approximately 10 of the 20 types of metallic deposits known to be present in the EMNSA (Hodges and Ludington, 1991). The section below entitled “Evaluation of Metallic Mineral Resources” includes definitions of many terms used throughout this report.

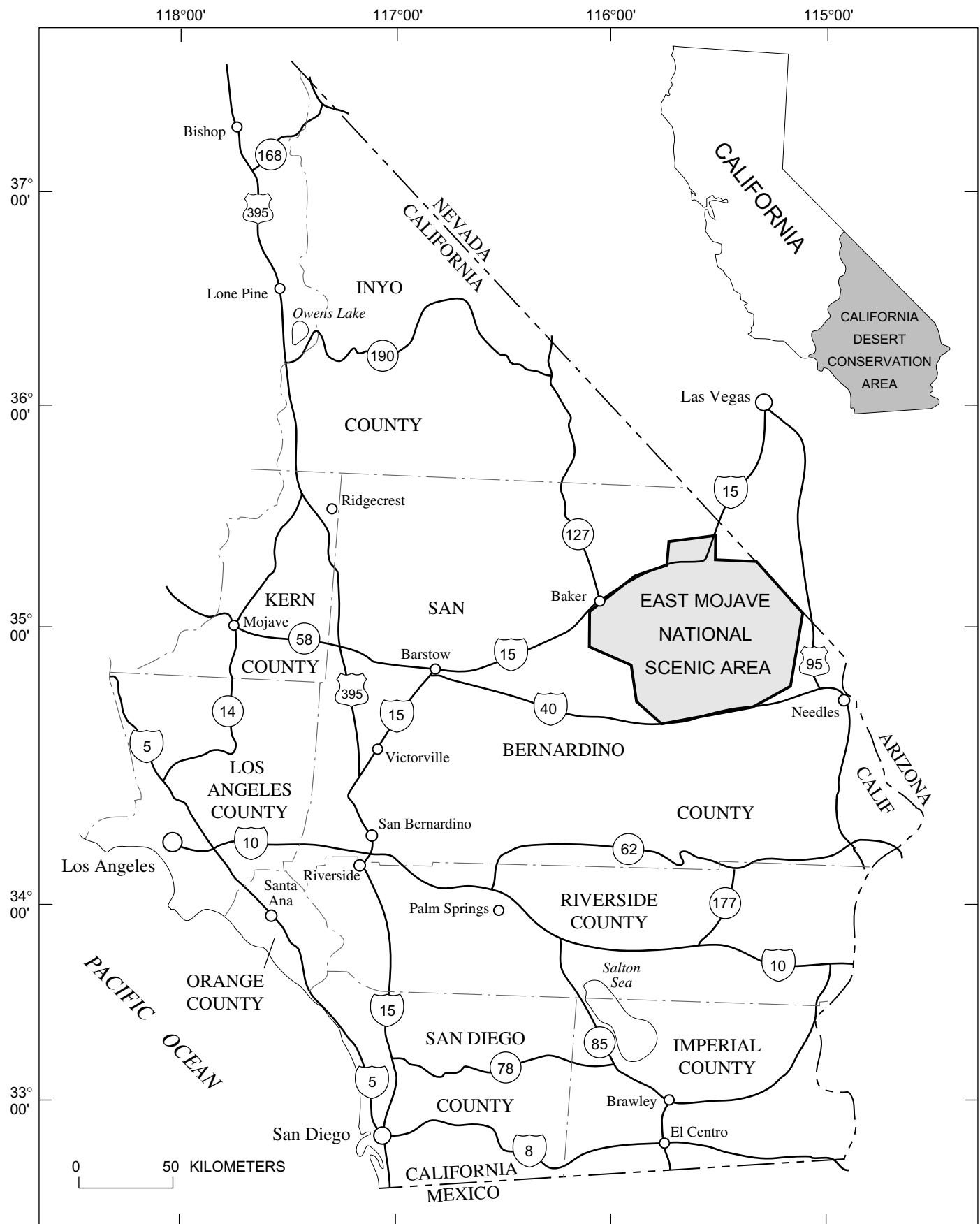


Figure 1. Location map showing East Mojave National Scenic Area, San Bernardino County, Calif.

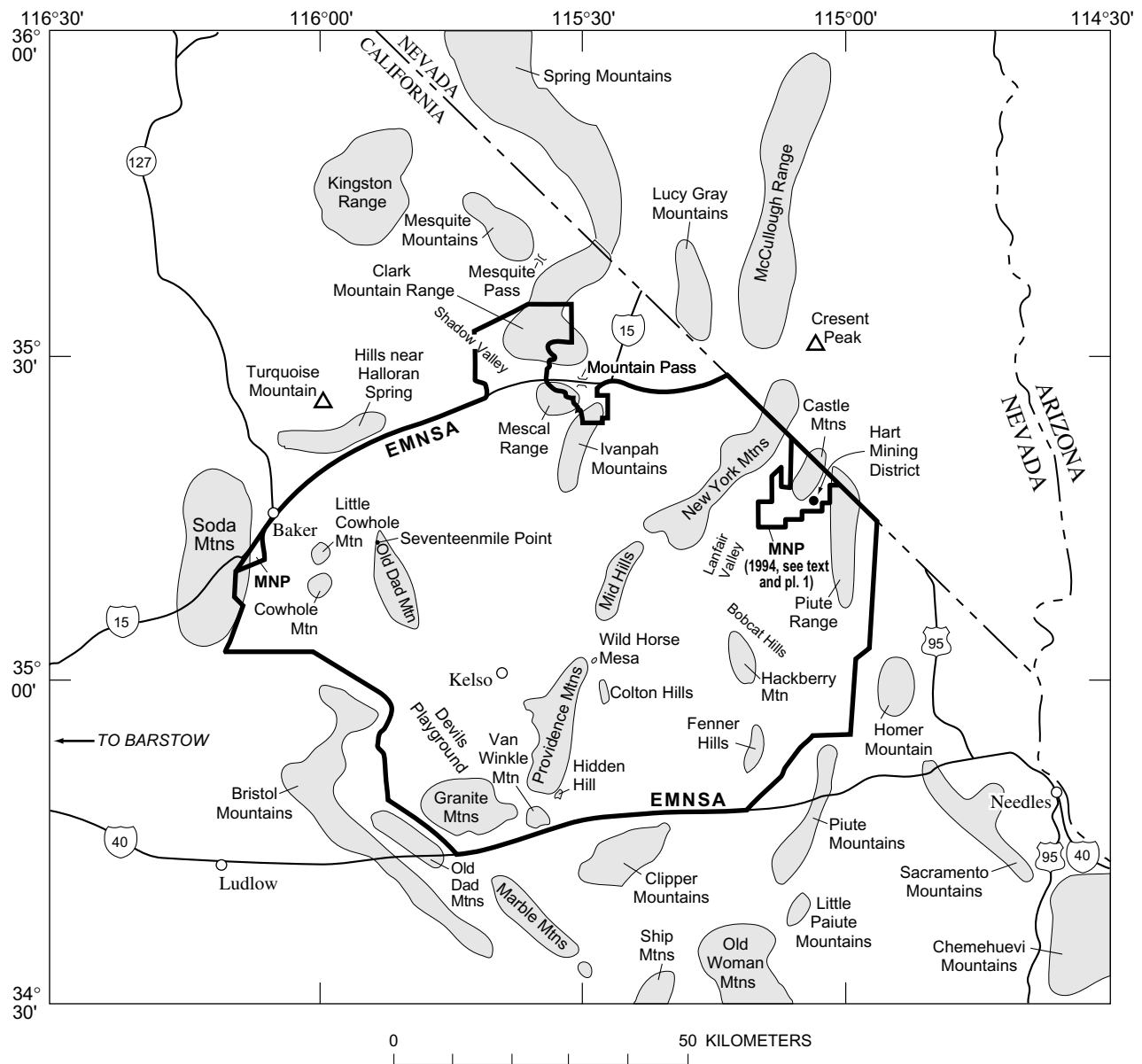


Figure 2. Index map of the East Mojave National Scenic Area (EMNSA, heavy line), Mojave National Preserve (MNP), and locations of major mountain ranges in California and Nevada. Congressional intent is to exclude all private land in the Lanfair Valley area from inclusion in the MNP.